



## MMSZ4678 THRU MMSZ4716

### 500mW Silicon Zener Diodes

### Features

- Zener Voltage 1.8V-39V
- Very Sharp Reverse Characteristic
- VZ – tolerance  $\pm 5\%$
- High Reliability
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

### Mechanical Data

- Halogen free available upon request by adding suffix "-HF"
- Polarity: Cathode indicated by polarity band
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)

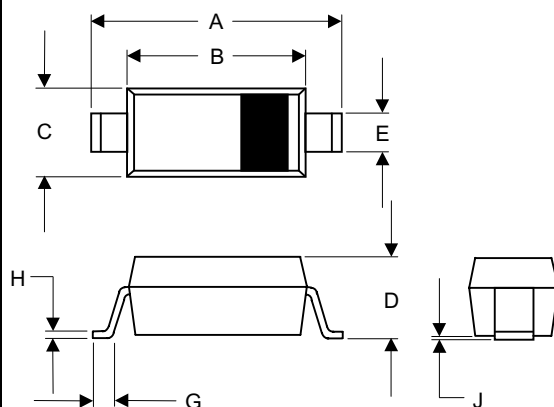
### Maximum Ratings

|                                                                                    | Symbol     | Value      | Units            |
|------------------------------------------------------------------------------------|------------|------------|------------------|
| Max. Steady State Power Dissipation at $T_L < 75^\circ\text{C}$ , Lead Length=3/8" | $P_D$      | 500        | mW               |
| Junction Temperature                                                               | $T_J$      | 150        | $^\circ\text{C}$ |
| Storage Temperature Range                                                          | $T_{STG}$  | -55 to 150 | $^\circ\text{C}$ |
| Thermal Resistance( Junction to Ambient)                                           | $R_{thJA}$ | 340        | K/W              |

### Electrical Characteristics @ 25°C Unless Otherwise Specified

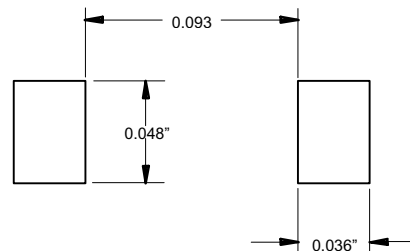
|                                          | Symbol | Maximum | Unit |
|------------------------------------------|--------|---------|------|
| Max. Forward Voltage @ $I_F=10\text{mA}$ | $V_F$  | 0.95    | V    |

### SOD-123



| DIM | INCHES |       | MM    |       | NOTE |
|-----|--------|-------|-------|-------|------|
|     | MIN    | MAX   | MIN   | MAX   |      |
| A   | .140   | .152  | 3.55  | 3.85  |      |
| B   | .100   | .112  | 2.55  | 2.85  |      |
| C   | .055   | .071  | 1.40  | 1.80  |      |
| D   | -----  | .053  | ----- | 1.35  |      |
| E   | .012   | .031  | 0.30  | .78   |      |
| G   | .006   | ----- | 0.15  | ----- |      |
| H   | -----  | .01   | ----- | .25   |      |
| J   | -----  | .006  | ----- | .15   |      |

### SUGGESTED SOLDER PAD LAYOUT

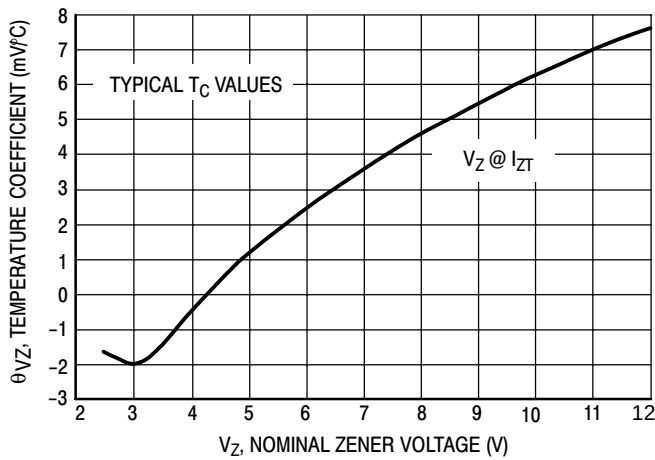


# MMSZ4678 thru MMSZ4716

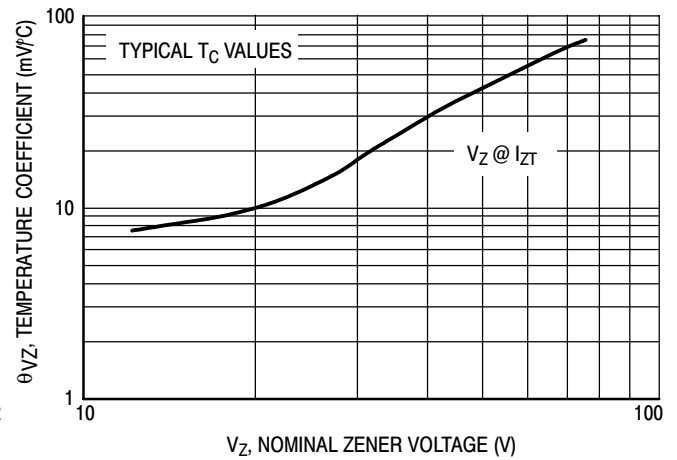
**Electrical Characteristics (T<sub>i</sub>= 30°C Unless Otherwise Noted, V<sub>F</sub>=0.95V Max @ I<sub>F</sub>=10mA for all types)**

| Device   | Zener Voltage          |      |       |                  | Leakage Current                |       | Device Marking |
|----------|------------------------|------|-------|------------------|--------------------------------|-------|----------------|
|          | V <sub>Z</sub> (Volts) |      |       | @I <sub>ZT</sub> | I <sub>R</sub> @V <sub>R</sub> |       |                |
|          | Min                    | Nom  | Max   | u A              | u A                            | Volts |                |
| MMSZ4678 | 1.71                   | 1.8  | 1.89  | 50               | 7.5                            | 1.0   | CC             |
| MMSZ4679 | 1.90                   | 2.0  | 2.10  | 50               | 5.0                            | 1.0   | CD             |
| MMSZ4680 | 2.09                   | 2.2  | 2.31  | 50               | 5.0                            | 1.0   | CE             |
| MMSZ4681 | 2.28                   | 2.40 | 2.52  | 50               | 2.0                            | 1.0   | CF             |
| MMSZ4682 | 2.565                  | 2.7  | 2.835 | 50               | 1.0                            | 1.0   | CH             |
| MMSZ4683 | 2.85                   | 3.0  | 3.15  | 50               | 0.8                            | 1.0   | CJ             |
| MMSZ4684 | 3.135                  | 3.3  | 3.465 | 50               | 7.5                            | 1.5   | CK             |
| MMSZ4685 | 3.42                   | 3.6  | 3.78  | 50               | 7.5                            | 2.0   | CM             |
| MMSZ4686 | 3.705                  | 3.9  | 4.095 | 50               | 5.0                            | 2.0   | CN             |
| MMSZ4687 | 4.085                  | 4.3  | 4.515 | 50               | 4.0                            | 2.0   | CP             |
| MMSZ4688 | 4.465                  | 4.7  | 4.935 | 50               | 10                             | 3.0   | CT             |
| MMSZ4689 | 4.845                  | 5.1  | 5.355 | 50               | 10                             | 3.0   | CU             |
| MMSZ4690 | 5.32                   | 5.6  | 5.88  | 50               | 10                             | 4.0   | CV             |
| MMSZ4691 | 5.89                   | 6.2  | 6.51  | 50               | 10                             | 5.0   | CA             |
| MMSZ4692 | 6.46                   | 6.8  | 7.14  | 50               | 10                             | 5.1   | CX             |
| MMSZ4693 | 7.125                  | 7.5  | 7.875 | 50               | 10                             | 5.7   | CY             |
| MMSZ4694 | 7.79                   | 8.2  | 8.61  | 50               | 10                             | 6.2   | CZ             |
| MMSZ4695 | 8.265                  | 8.7  | 9.135 | 50               | 10                             | 6.6   | DC             |
| MMSZ4696 | 8.645                  | 9.1  | 9.555 | 50               | 10                             | 6.9   | DD             |
| MMSZ4697 | 9.50                   | 10   | 10.5  | 50               | 10                             | 7.6   | DE             |
| MMSZ4698 | 10.45                  | 11   | 11.55 | 50               | 0.05                           | 8.4   | DF             |
| MMSZ4699 | 11.40                  | 12   | 12.6  | 50               | 0.05                           | 9.1   | DH             |
| MMSZ4700 | 12.35                  | 13   | 13.65 | 50               | 0.05                           | 9.8   | DJ             |
| MMSZ4701 | 13.30                  | 14   | 14.7  | 50               | 0.05                           | 10.6  | DK             |
| MMSZ4702 | 14.25                  | 15   | 15.75 | 50               | 0.05                           | 11.4  | DM             |
| MMSZ4703 | 15.20                  | 16   | 16.8  | 50               | 0.05                           | 12.1  | DN             |
| MMSZ4704 | 16.15                  | 17   | 17.85 | 50               | 0.05                           | 12.9  | DP             |
| MMSZ4705 | 17.10                  | 18   | 18.9  | 50               | 0.05                           | 13.6  | DT             |
| MMSZ4706 | 18.05                  | 19   | 19.95 | 50               | 0.05                           | 14.4  | DU             |
| MMSZ4707 | 19.00                  | 20   | 21    | 50               | 0.01                           | 15.2  | DV             |
| MMSZ4708 | 20.9                   | 22   | 23.1  | 50               | 0.01                           | 16.7  | DA             |
| MMSZ4709 | 22.8                   | 24   | 25.2  | 50               | 0.01                           | 18.2  | DX             |
| MMSZ4710 | 23.75                  | 25   | 26.25 | 50               | 0.01                           | 19.0  | DY             |
| MMSZ4711 | 25.65                  | 27   | 28.35 | 50               | 0.01                           | 20.4  | EA             |
| MMSZ4712 | 26.6                   | 28   | 29.4  | 50               | 0.01                           | 21.2  | EC             |
| MMSZ4713 | 28.5                   | 30   | 31.5  | 50               | 0.01                           | 22.8  | ED             |
| MMSZ4714 | 31.35                  | 33   | 34.65 | 50               | 0.01                           | 25.0  | EF             |
| MMSZ4715 | 34.2                   | 36   | 37.8  | 50               | 0.01                           | 27.3  | EF             |
| MMSZ4716 | 37.05                  | 39   | 40.95 | 50               | 0.01                           | 29.6  | EH             |

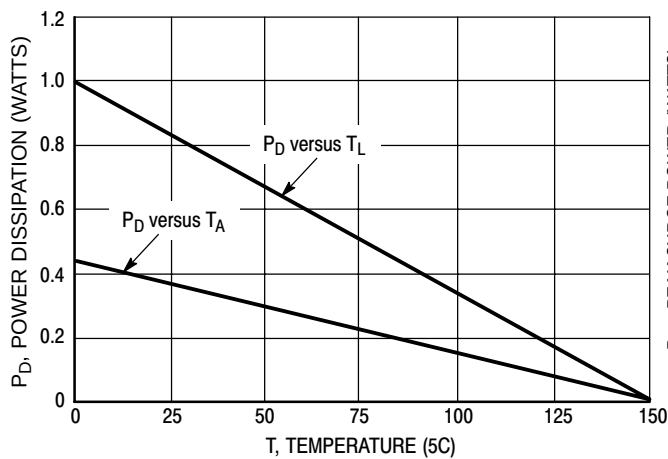
## TYPICAL CHARACTERISTICS



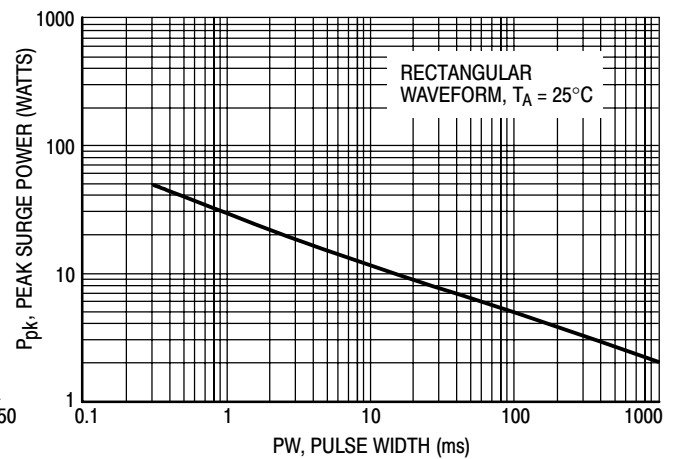
**Figure 1. Temperature Coefficients**  
(Temperature Range -55°C to +150°C)



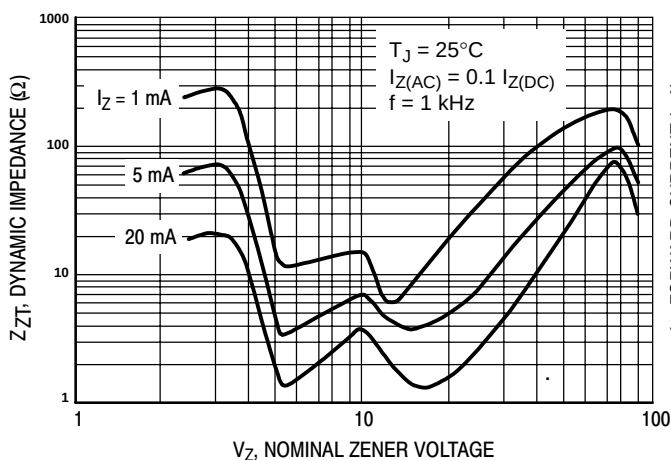
**Figure 2. Temperature Coefficients**  
(Temperature Range -55°C to +150°C)



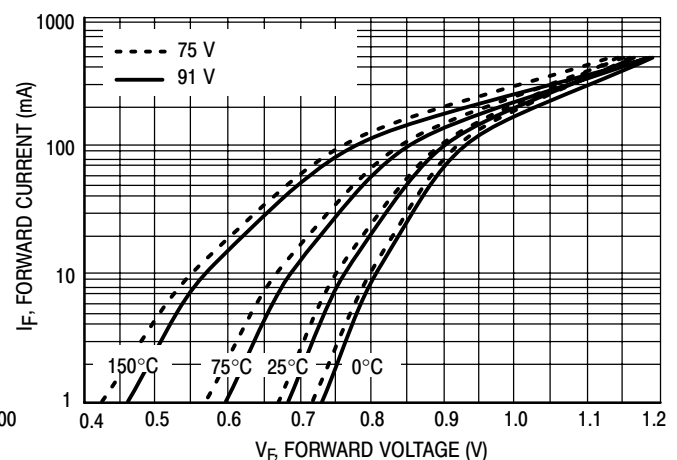
**Figure 3. Steady State Power Derating**



**Figure 4. Maximum Nonrepetitive Surge Power**



**Figure 5. Effect of Zener Voltage on**  
**Zener Impedance**



**Figure 6. Typical Forward Voltage**

## TYPICAL CHARACTERISTICS

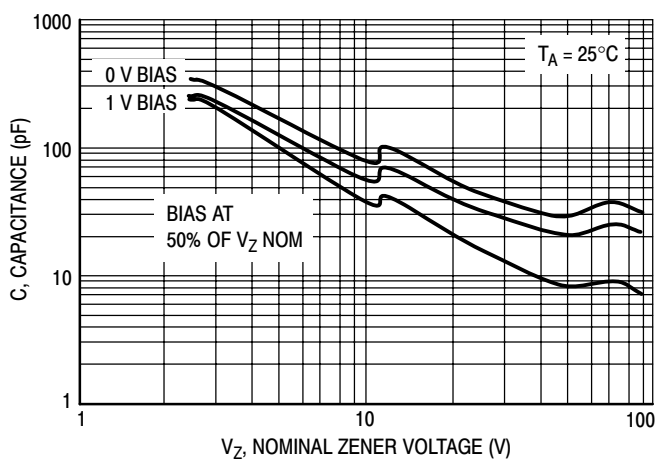


Figure 7. Typical Capacitance

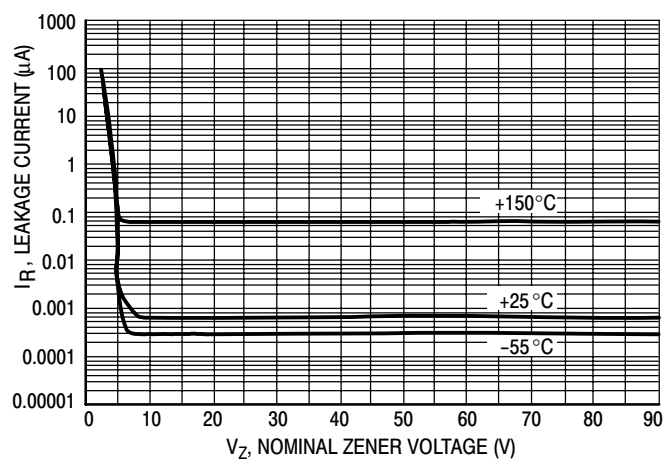


Figure 8. Typical Leakage Current

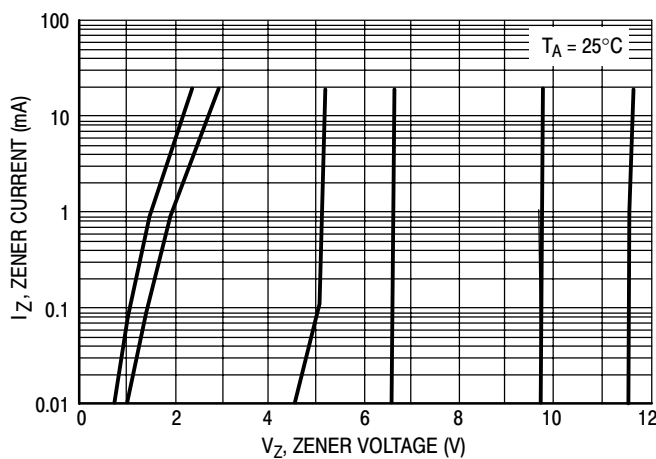


Figure 9. Zener Voltage versus Zener Current  
( $V_Z$  Up to 12 V)

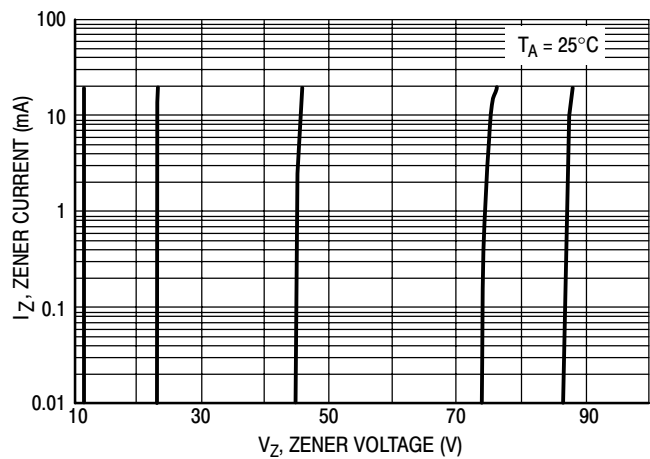


Figure 10. Zener Voltage versus Zener Current  
(12 V to 91 V)

## Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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